Solar Working Sub-Groups

Solar Sub-Group Updates

Julie Baldwin, Kevin Krause, Jesse J. Harlow
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Value of Solar Subgroup Update

Meeting:

February 25th

Conference Calls:

March 24 & April 7

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Data Update

- Data Sets we now have:
  - 2013 MISO Michigan Hub Hourly LMP Day Ahead Data
  - 2013 hourly kWh data from DTE's training center 386 kW DC Array
  - 2013 hourly kWh data from MAREC's 30 kW array (AC or DC rating nameplate capacity?)

Effective Load Carrying Capability Preliminary Results

- Options:
  - DTE 386 kW training center array
    - Overall 2013 capacity factor: 14%
    - 3 daily peak hours during June, July & August 2013: 40%
  - MAREC 30 kW array
    - Overall 2013 capacity factor: 10%
    - 3 daily peak hours during June, July & August 2013: 53%
  - Consumers Energy Calculated Solar Capacity Credit: 45%

Distribution Line Loss

- MN Report Example: 5 – 9%
- The Line Loss Factor is used to show the increased value of a kWh generated on the distribution system.
- A kWh generated on the residential portion of the system avoids the most line losses and should have the highest line loss factor.

DTE Tariff Sheet E-20.00

E18 REAL POWER LOSSES

The Marketer used by the Alternative Electric Supplier is responsible for replacing losses associated with the delivery of power to the Customer's meter. The amount of Power delivered by DTE Electric on the DTE Electric Distribution System to the Customer's meter shall be adjusted using the following real power loss factors for distribution service:

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Secondary	10.88%	11.95%	12.01%	10.23%
4.8/13.2 kV	6.61%	7.13%	7.37%	6.31%
24kV/41.6 kV	1.86%	2.09%	2.34%	1.90%
120 kV and above	0.55%	0.57%	0.57%	0.55%

Marketers must schedule and supply an amount of Power equal to its Customers' hourly usage x [(1 + D%) x (1 + T%)] to account for losses on the ITC Transmission and DTE Electric Distribution System, where T% is the applicable loss factor posted on the Midwest ISO's OASIS and D% is the applicable loss factor from the table above.

Consumers Energy Line Losses

- Residential Tariff

Real Power Losses:

The Retailer is responsible for replacing Real Power Losses of 9.062% on the Company's Distribution System associated with the movement of Power and for compensation for losses.

- Other Customers

Real Power Losses:

The Retailer is responsible for replacing Real Power Losses as shown below on the Company's Distribution System associated with the movement of Power and for compensation for losses.

	Meter Point	
	High Side	Low Side
Customer Voltage Level 1	0.000%	0.567%
Customer Voltage Level 2	2.100%	2.961%
Customer Voltage Level 3	5.316%	9.062%

Line Loss Factor Options

- Ideally, the line loss factor should be adjusted to reflect that some portion is not actually line loss. It appears there is no way to precisely determine the adjustment.
- Options:
  - Use average line loss % in utility's tariff book for each service voltage level. This could be justified because the average may be lower than actual line losses at the time solar is generated.
  - Reduce the average line loss % for each voltage level by an arbitrary % to account for non-line loss.

Avoided Fuel Cost
Preliminary Results

- Options:
  - $0.038/kWh using DTE Solar Data & 2013 LMPs
  - $0.040/kWh using MAREC Data & 2013 LMPs

  - January 2014 on-peak, day ahead LMP: $0.08501/kWh
  - February 2014 on-peak, day ahead LMP: $0.09862/kWh

Avoided Environmental Cost

Solar REC Calculation

Base REC		1		
Incentive Solar REC		2		
Incentive On-Peak REC		0.14		
		3.14	RECs	per MWh
REC $	**$**	**2.00**	**REC**	***What is an appropriate REC price?***
	$	6.29	per MWh	
REC $	$	0.006	per kWh	

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Next Steps

- Avoided Plant O&M - Fixed
- Avoided Capacity Cost
- Avoided Reserve Capacity Cost
- Peak Load Reduction

Solar Tariff, Rate Impact and Program Caps

- Tariff Design
- Tariff Model
- Tariff Recovery

Tariff Design

- Variable – changing each year
- Fixed for XX years
  - Flat – more money up front
  - Escalating – less money up front but increases
- Dynamic
  - LMP portion paid based on real-time
- Customers like options

Tariff Model

- Net Metering
- Buy All/Sell All
  - Buy rates set by general rate cases
  - Sell rate set by a VOS Tariff
- Buy Net/Sell Net
  - Only Buy when consumption exceeds generation
  - Only Sell when generation exceeds consumption

Tariff Recovery

- Renewable Energy Credits
  - Need not be included in Tariff
  - If purchased need to be recovered in Act 295 proceeding
- Prefer Energy/Capacity recovery in PSCR

Next Steps

- Program Caps
- Analyzing impact of various program sizes on PSCR, Base Rates, or Renewable Energy Surcharge

Program Design (Existing Programs)

- Ultimate Goals of Current Programs and/or Expansions
  - Higher Capacity
  - Reduced Price
  - Remove Lottery

Program Design (Existing Programs)

- Higher Capacity
  - Could be accomplished through a reduced price
  - Could utilize VOS or Dynamic Pricing
  - Billing system updates would be necessary to adjust payments based on energy market signals
    - Adjustments based on LMPs
    - May be necessary to adjust pricing in tranches based on time periods or capacity influxes

Program Design (Existing Programs)

- Eliminate Lottery
  - Require lower payments to provide fluid and even customer interest
  - Possible Queue to mitigate administrative burden

Program Design (Existing Programs)

- Barriers
  - Both the SolarCurrents and Experimental Advanced Renewable Program are nearing caps
    - (Caps based on total funding)
    - SolarCurrents has 1 phase left
    - EARP has approximately $3 Million after upcoming phases 17 and 18
- Potentially applies to expansions???

Program Design (Community Solar)

- Community Solar
  - Utility should conduct market research first and foremost to predict most successful implementation:
    - Utility owned program and/or
      - Most likely quickest to market
    - Third party finance option
      - Possible utilization 2013 PA 264 (Crowd Funding)
      - Xcel Solar*Rewards Community Program

Program Design (Community Solar)

- Customer Compensation
  - Bill credit based on VOS
  - Bill credit based on LMP
  - Bill credit based on Retail Rate
    - Virtual Net Metering

Program Design (Community Solar)

- Options…
  - Under utility build, wait until program is 80%-120% subscribed
  - Sell shares in:
    - kW blocks
    - kWh blocks
    - By panel
  - Lease?

Program Design

- Tasks for next sub-group
  - Proposals for existing expansion programs to be reviewed at next combined meeting
  - Utilities to offer economic data for company-owned Community Solar models